DOCUMENT RESUME

ED 429 750 RC 021 900

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TITLE	Teachers' Perceptions of Curriculum Modification for Students Who Are Gifted.
PUB DATE	1999-03-00
NOTE	11p.; In: Rural Special Education for the New Millennium. Conference Proceedings of the American Council on Rural Special Education (ACRES) (19th, Albuquerque, New Mexico, March 25-27, 1999); see RC 021 888.
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Beliefs; *Curriculum Development; Educational Environment; Elementary Secondary Education; *Gifted; *Individualized Instruction; Q Methodology; Special Education; Special Education Teachers; *Teacher Attitudes; Teaching Methods
IDENTIFIERS	*Differentiated Curriculum (Gifted)

ABSTRACT

Differentiating instruction for diverse learners means planning and implementing curriculum based on each student's level of readiness. Appropriate curriculum development for gifted and talented students involves differentiation of content, teaching and learning strategies, and student products in a student-centered environment. A study used Q methodology to determine teacher perceptions of curriculum modification for students who are gifted and talented. Q methodology is used to describe subjective opinions about behaviors and compare the relative strengths of those behaviors according to the beliefs of any individual. Concourse theory was used to generate 48 statements about curriculum modifications for gifted students. Five general education teachers, two administrators, and ten teachers of gifted students completed Q-sorts of the statements under two conditions: their perceptions of their own actual instructional practices with gifted and talented students, and their beliefs about ideal practices for teaching gifted students. Results included three theoretical arrays of teacher beliefs: differentiating according to student academic needs; differentiating according to teacher practices; and differentiating according to process ideas and student practices. Contains 24 references. (CDS)

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ED 429 750

TEACHERS' PERCEPTIONS OF CURRICULUM MODIFICATION FOR STUDENTS WHO ARE GIFTED

Educators are faced with a variety of challenges in today's classrooms. Teachers must adapt the curriculum and learning environment to provide a classroom climate that meets the academic, social, and emotional needs of the students who have a wide range of readiness skills, learning styles, and curricular needs. Expectations for excellence at the national level, state curriculum requirements, and local school district guidelines restrict the choices an educator has regarding the development and implementation of the curriculum. Furthermore, each teacher has a background of experiences that influence how he or she perceives what each learner needs (Good, 1982) and what the appropriate educational response to the need might be (Johnson, 1993).

There is greater complexity in the diversity of students in classrooms today. The learning needs of students are often determined by school psychologists or other educational specialists to correspond to various educational diagnoses, such as learning disabled, emotionally disturbed, gifted and talented, or any combination of a other educational descriptors. Special programs are provided to the general education classroom environment for these students. Teachers respond to the diagnosis of student need and programming in two major ways: (1) concern about the overall welfare of the child as the teacher strives to determine appropriate curriculum, and (2) concern whether specialized treatment is necessary for the child with diverse learning needs (Robinson, 1985).

Recent trends in education have shifted from separate programs for children identified as needing differentiated programs to inclusive classrooms where students with diverse abilities receive specialized instruction together in the general education classroom. This means that students who are learning at a different pace, breadth, and depth are being taught using the same curriculum structure and class environment. General education teachers find "teaching to the middle" a method of instruction as a response to such demands of diversity (Tomlinson, 1995). The question to ask, however, is how many children are actually in "the middle?" What happens with the student who requires additional time and explanation on an assigned task when the teacher is ready to move on to another topic? Likewise, questions must be asked about the curriclum for the student who catches on to a concept quickly, does not require drill and practice, and does not fit into this one-size-fits-all classroom (Tomlinson & Kiernan, 1997).

Differentiated Curriculum

Differentiating instruction for diverse learners is an educational phenomenon that enables teachers to develop and implement curriculum that is appropriate for all students (Tomlinson, 1995; Tomlinson & Kiernan, 1997). Students are successful in differentiated classrooms because the teacher is planning and implementing curriculum based on each student's own level of readiness (Tomlinson, 1995) and moving the student forward with skills, knowledge, and educational relevance, rather than teaching all students in the same way.

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The impact of this type of instruction on students who are gifted and talented is far-reaching. Students may be learning more advanced concepts, developing more dynamic products, and understanding connections between what is being taught and how the information fits into the real world. How the teacher perceives his/her classroom of diverse learners influences the methods of instruction employed in that classroom (Carter, 1971; Rubenzer & Twaited, 1979).

Appropriate curriculum development for students identified as gifted and talented ensures that there are qualitative differences from the general education curriculum in content, process, product, and learning environment (Maker, 1982). This means that students who are gifted and talented are provided with expanded educational opportunities, rather than more of the same (MOTS) projects and assignments. The development of curriculum should be differentiated for learners who are gifted and talented, meaning that instruction is integrated and adapted to the varying levels of student readiness and ability. High levels of cognitive and affective concepts and processes are employed in the differentiated classroom. Student product development is based on the individual student's educational needs and goals. The differentiated learning environment is flexible, allowing students to work individually, in small homogeneous or heterogeneous groups, or in a whole class setting (Maker, 1982; Tomlinson, 1996).

Differentiation of instruction for students who are gifted and talented focuses on the elaboration of the presentation of learning opportunities, the diversity of methods of presentation, and the variety of student products and student assessments (Tomlinson & Kiernan, 1997). Students are exposed to content learning opportunities outside of the limits of the textbook and the typical age/grade expectations. Allowing additional work time, materials, and resources encourages flexibility in the general education curriculum. Students develop critical thinking skills through the integration of content subject matter. Assessing student products requires individual grading rubrics rather than one set of criteria for the entire learner population (Tomlinson, 1995).

Content Differentiation

Differentiation of content is defined as modifying what is being taught to the student (Maker, 1982; Maker & Nielson, 1996; Tomlinson & Kiernan, 1997). Appropriate content for students who are gifted and talented is more complex, more abstract, and more varied than that of the general education learner. Included in content modifications is the study of creativity and creative productivity (Shanley, 1993). Complex content includes the manipulation of more concepts, abstract concept relationships, and the integration of concepts across disciplines or fields of study. Abstractness takes the learner from the data level (focusing on facts and isolated information) through concept development (focusing on ideas and classes of knowledge) to the generalization level (focusing on the student's ability to impose conceptual knowledge on a wider field of understanding). Varied content incorporates the idea of enriched content as the learner is involved in a systematic sampling of different types of content.

Process Differentiation

Process modification is described as the way educators teach (Maker, 1982) or how the students make sense of what they are learning (Rosselli, 1993; Tomlinson, 1995). The teacher who is making appropriate process modifications employs higher level thinking strategies, open endedness, variable pacing, and student discovery. Emphasizing the use of a body of knowledge rather than the acquisition of that knowledge enables the learner to develop higher levels of thinking skills. Encouraging divergent thinking more than convergent thinking defines curriculum open endedness (Maker, 1982), as students look for many, varied, and unusual solutions, not just the one correct answer. Flexible pacing allows students who demonstrate mastery of a concept or set of concepts to move on to the next level regardless of the overall pace of the classroom. Developing skills of inductive and deductive reasoning permit

students who are gifted and talented to value discovery learning where looking for the answers is an important as solving the problem (Tomlinson, 1995).

Product Differentiation

Student products allow the learner to demonstrate his/her understanding of content and processes. Modifications in products for students who are gifted and talented include having real problems and audiences (Maker, 1982; Reis & Schack, 1993), using authentic assessments (Renzulli, 1977), and transforming and synthesizing information in a meaningful way (Maker, 1982). Real problems and real audiences encourage students to work with a specific purpose in mind instead of completing tasks for a classroom grade (Renzulli, 1977). Assessments of student products in a differentiated classroom include the use of established criteria by which the student, members of the real audience, his/her peers, or the teacher will make the evaluation. Product transformation and synthesis occurs as students demonstrate the interconnectedness of information rather than a summary of the facts.

Learning Environment Differentiation

The learning environment in a differentiated classroom is not chaotic (Schiever, 1993; Sisk, 1993; Tomlinson, 1995), but rather interactive. Educational settings where differentiated learning environments are found emphasize student centeredness, independent, and mobility. The focus of a student-centered classroom is on the learners, with the teacher assuming the role of facilitator where he/she once was the sole dispenser of knowledge (Tomlinson, 1995; Tomlinson & Kiernan, 1997). Student independence includes freedom of student choice and teacher tolerance for student diversity. Mobility of students is important in a differentiated classroom as students are free to move among and between workstations and learning areas to complete tasks. Classroom management and mutual student-teacher respect contribute to a successfully differentiated learning environment.

Teacher Attitudes

Personal attitudes about how students should be taught prevail for teachers and administrators. These attitudes influence what curriculum is relevant and the nature of the physical location where students should receive their education. The teacher's beliefs and perceptions are evident in the types of questions asked of students in his or her classroom, the types of feedback given to students (Good, 1982), the grade level and subjects preferred, and the reinforcements provided for students. The effect of teacher beliefs and perceptions influences the teacher's academic expectations of students with varying academic abilities.

The purpose of this study was to describe the ways that teachers perceive the education of students who are gifted and talented. The perceptions were determined based on how teachers believe they adapt curriculum to meet the needs of students are gifted and talented, and how they thought such students should be taught. Teacher perceptions were studied using a Q-sort, with sample questions extracted from literature relevant to differentiation of the education for students who are identified as gifted and talented.

The research question of primary interest investigated in this study is:

1. What are the predominant beliefs related to teaching practices for students who are gifted and talented?

Method

Q methodology is a research method that can describe subjective opinions about behaviors and compare the relative strengths of those behaviors according to the beliefs of any individual

(Montgomery, 1983). The method is comprised of established procedures and a conceptual framework that assist in defining a particular phenomenon (Brown, 1993), in this case, teachers perceptions of curriculum modifications for students who are gifted.

Participants

Seventeen (17) educators participated in this study. Five (5) were teachers in general education, two (2) were administrators, and (10) were teachers who spend more than 75% of their time in gifted education. Participants ranged in experience from 2 to 27 years and were from public school districts located in Oklahoma. Ten (10) of the educators were from rural school districts with five considered to be remotely located (more than 50 miles from an urban center) and five of the ten were located closer to towns or cities. Seven of the participants were from urban school districts. Five of these seven were from school districts located in the inner city, one was from an affluent urban district, and one was from a college town. Fourteen (14) of the educators were women and three were men.

Instrument

A concourse is the set of opinion statements representing all possible statements related to the study (Brown, 1980). Concourse theory was used to generate items for the study. Statements about curriculum modifications for gifted students were extracted from the literature and organized by using a theoretical framework (see Table 1). Two theories were used to construct the matrix for the development of statements for the Q sort. The theories were the major principles of curriculum modification for students who are gifted (Maker, 1992) and the three levels of differentiation found by Tomlinson (1996) in a middle school case study.

Table 1
Theoretical Framework for Q-Set on Curriculum Modifications for Gifted Learners

		Levels	
Principles	No Differentiation	Micro Differentiation	Macro Differentiation
Content	5	5	5
Process	5	5	5
Product	3	3	3
Environment	3	3	3

Over one hundred (100) statements of strategies and recommended practices for the education of the gifted and talented were obtained through relevant literature (see Shore, Cornell, & Robinson, 1991; Van Tassel Baska, 1994; VanTassel Baska, 1997). Statements were reviewed and refined by a panel of experts which included two (2) university faculty members, four (4) public school administrators, and three (5) teachers in regular and gifted education who were experienced in educational trends relating to the education of students who are gifted and talented. Each member of the panel of experts was instructed to review the statement according to literature in the field of gifted and talented education, redundancy, range of meaning, and language used by teachers in public schools. After the review by the panel of experts, forty-eight (48) statements were retained as statements or items on the Q-sort to represent the theoretical categories. The form board was constructed to present a range of 11 piles or column with a specified number of items or statements to be placed in each column so all statements are placed in only one place on the board. The following distribution was used: 2-3-4-5-6-8-6-5-4-3-2

Procedures

Respondents completed the Q sorts under two conditions of instruction: (1) What do you believe you are currently doing in your class for gifted students? and (2) What do you believe is the ideal way

for teaching gifted students? The first condition of instruction seeks what participants perceive as their actual instructional practices for students who are gifted and talented. The second condition of instruction elicits what participants believe would be the ideal educational approach related to the education of students who are gifted and talented.

After the second sorting, participants completed a post-sort question that asked for other ideas about curriculum modifications for students who are gifted or any other comments or explanations for either sort. This question serves two purposes (1) it allows participants to express ideas that might not be clearly stated in any of the statements and (2) the responses serve as support Interpretation. As much information as possible is collected to interpret the factors according to the meaning the statements held for those people whose Q-sort loaded on the factor considered for interpretation.

Q sort data were coded and entered in PQMethod (Schmolck, 1997) software application program. The analysis program first correlates each of the sorts to each of the other sorts, then a principle components factor analysis was conducted, followed by varimax rotation and factor interpretation to respond to the research questions.

Results

Each of the seventeen (17) participants sorted twice which yielded 34 sorts for the analysis. Each Q-sort was correlated with all others followed by a factor analysis using principal components technique, although centroid analysis is recommended by Q methodologists (Brown, 1980, McKeown & Thomas, 1988), principle components provided the greatest statistical efficiency for the varimax rotation. A three factor solution was chosen as the best fit because it accounted for more of the sorts than the four factor solution. Although thirteen (13) sorts were confounded (loaded significantly on more than one factor, only two sorts did not significantly load on any factor). The level of significance was established at a common default of .45 to determine factor loadings (Table 2).

Table 2
Significant Factor Loadings for a Three-Factor Solution

Demographic of Q sorter	Factor 1	Factor 2	Factor 3
1. Actual Female GT Rural	X		
2. Ideal for #1	X		
3. Actual Female GT Rural			
4. Ideal for #3			
5. Actual Female GT Rural (remote)		X	
6. Ideal for #5			
7. Actual Female Admin Urban (inner city)			
8. Ideal for #7			
9. Actual Female GT Urban (inner city)			
10. Ideal for #9		X	
11. Actual Female GT Urban (inner city)			X
12. Ideal for #11			X
13. Actual Male English Urban (inner city)			
14. Ideal for #13			X
15. Actual Female GT Urban (inner city)			
16. Ideal for #15	X		
17. Actual Female English AP rural (remote)	X		
18. Ideal for #17			

Demographic of Q sorter	Factor 1	Factor 2	Factor 3
19. Actual Female GT Rural		X	
20. Ideal for #19		X	
21. Actual Female GT Urban (affluent)			
22. Ideal for #21			
23. Actual Female Elem Rural (remote)		X	
24. Ideal for #23			
25. Actual Female GT Urban-college		X	
26. Ideal for #25			
27. Actual Female general Rural (remote)			X
28. Ideal for #27			X
29. Actual Male Sec-Tech rural			X
30. Ideal for #29	X		
31. Actual Male general Rural (remote)	X		
32. Ideal for #31		X	
33. Actual Female Admin Rural (remote)			
34. Ideal for #33			

Sorts that loaded on more than one factor: 3, 4, 6, 7, 8, 15, 18, 21, 22, 24, 26, 33, 34
Sorts that were non-significant with this solution: 9, 13

The factor scores for the three-factor solution were used to determine the z-scores for all items in each factor. The ordering of the z-scores in descending order allows the representation of the theoretical array for each of the three factors. Each of these arrays was interpreted to respond to the research questions for this study.

What are the predominant beliefs related to teaching practices for students who are gifted and talented?

There were three factors that emerged from this study to represent the beliefs of teachers for developing curriculum for students who are gifted. The beliefs are named (1) Differentiating According to Student Academic Needs, (2) Differentiating According to Teaching Practices, and (3) Differentiating According to Process Ideas. These are the three theoretical arrays or beliefs held by the teachers who participated in the study. A description of the educators who significantly defined each of these theoretical arrays is essential to the interpretation of the factor. Indeed, understanding the characteristics of those who defined the factor served as data in factor interpretation. The following is a summary description of the teachers who defined the factor and the theoretical interpretation of the factor.

Differentiating According to Student Academic Needs

There were seven (7) sorts that significantly loaded on this factor representing views that teachers held (see Table 2). The actual and ideal sorts for one participant who is female and teaching gifted students in a rural district defined this factor. In addition, the actual sort for two other female gifted teachers (one rural and remote; one urban) and one male general educator from a rural remote district loaded on this factor. Ideal sorts loaded on the factor from a female gifted teacher from an urban district and a male general teacher from a rural district.

The teachers on this factor highly valued the academic needs of students. The statements describing the belief reveal a motivation to differentiate learning and evaluation for each student.

21. Different learning objectives and evaluation standards are set for different students based on the student's ability. (z-score 1.878)
43. Students are compacted out of content that they already know. (z-score 1.746)
39. Variable pacing for students is used based on the students' effort and ability. (z-score 1.52)
37. Student learning differences are varied, and modifications to accommodate for those differences should be made in the classroom (z-score 1.367)
22. Grading expectations for students are varied (z-score 1.358)

Lowest ranked statements are:

13. The more students practice the more they will learn (z-score –1.797)
7. The academic pace of the classroom is consistent for all students (z-score –1.616)
20. Gifted students are given more assignments/items to do than other students (z-score –1.571)
12. Grading criteria is consistent for all students (z-score –1.475)
30. Students will succeed because of a formal and rule-governed classroom environment (z-score –1.469)

Differentiating According to Teacher Practices

There were six (6) sorts that significantly loaded on this factor or six teacher's views that defined the theoretical array (see Table 2). The actual and ideal sorts for one participant who is female and teaching gifted students in a rural district defined this factor. In addition, the actual sort for two other female teachers, both from rural and remote school districts. One of the women was a GT teacher and one was teaching general education. Ideal sorts loaded on the factor were a female GT teacher from an urban inner city district and a male general teacher from a rural remote district.

The educators holding this belief are characterized by allowing certain teaching practices to provide for the needs of gifted students. Students are not expected to sit quietly, but can do other puzzles and assignments if they finish their work early. The teacher plans cooperative learning strategies and accommodates the interests of the students. Although the negative valenced z-scores indicate this educator does not have a teacher-directed classroom, the teacher is making many of the instructional decision. The teacher directs the classroom with the student interests and work pace considered. The highest ranked statements are as follows:

32. Students are not expected to always be sitting quietly at their desks/tables (z-score 1.671)
27. If students finish their work early, they may read, do puzzles, work on other assignments, or work on the computer (z-score 1.639)
47. Opportunities for cooperative and group work are provided for all students (z-score 1.538)
29. Gifted students are encouraged to ask questions that may extend the focus of the planned discussion (z-score 1.451)
36. Planned lessons and activities are modified based on the spontaneous interests and questions of students (z-score 1.299)

Lowest ranked statements are:

5. Lecturing is the best teaching method (z-score –2.071)
10. The classroom is teacher-oriented (z-score –1.834)
30. Students will succeed because of a formal and rule-governed classroom (z-score –1.754)
20. Gifted students are given more assignments/items to do than other students (z-score –1.635)
4. Gifted education services are a privilege to those students who qualify to receive them (z-score –1.550)

Differentiated According to Student Practices

There were six (6) sorts that significantly loaded on this factor or six teacher's views that defined the theoretical array (see Table 2). The actual and ideal sorts for two participants who are females and defined this factor. Of the two teachers whose actuall and ideal defined this factor, one was rural remote and one was urban inner city. The rural remote teacher was a general educator and the urban inner city teacher was a GT teacher. In addition, the actual sort for a male teacher from a rural district in general education and the ideal sort for a male teacher from an urban inner city district from general education defined this belief.

Teachers whose Q-sorts loaded on this factor were those who believed that lessons could be taught to meet the needs of gifted students. Critical and creative thinking skills are built into all lessons. Students were afforded the opportunities if they wanted to take advantage of the skill development they need. The placement of the items that this group felt strongly did not reflect their belief were highly standardized classes (lecturing with grading and assignments identical for all students). This indicates a strong belief that students can make the choices to get the education they need in their classrooms. Students can choose to delve as deeply in the content as they need without just doing puzzles and games to occupy their time. The statements to support this interpretation are listed. The strong positive z-score statements are:

26. Gifted students are given opportunities to develop and practice creative problem solving, critical thinking, and research skills (z-score 1.729)
42. Opportunities for students to actively practice critical thinking and creative problem solving skills are built in to all lessons (z-score 1.664)
41. Students are given situations that encourage them to experiment, explore, and solve problems on their own. (z-score 1.566)
39. Variable pacing for students is used based on the students' effort and ability (z-score 1.512)
1. Gifted students are expected to be able to challenge themselves and learn at their own pace (z-score1.413)

The lowest ranking statements are:

10. The classroom is teacher oriented. (z-score –2.141)
5. Lecturing is the best teaching method. (z-score –2.002)
27. If students finish their work early, they may read, do puzzles, work on other assignments, or work on the computer. (z-score –1.530)
7. The academic pace of the classroom is consistent for all students. (z-score –1.509)
8. Grading expectations are consistent for all students. (z-score –1.355)

Conclusions

The Student Academic Needs group places differentiated curriculum at the curricular level; whereas, the Teacher Practices group appears to focus on the teacher planning for students needs and the Student Practices group focuses on what students can reap from a common curriculum with minimal teacher intervention. Student Academic Needs group reveals an active role to identification and planned responses to meet the needs of gifted; whereas, the other beliefs believe that gifted students can participant at their own level in a curriculum designed for all students. None of the educators believe that more work or rigid classrooms are appropriate for gifted students.

The results of this research offers educational practitioners insights related to planning and developing curriculum for gifted students. Results of this study may further assist decision makers in career development (Tomlinson, Tomchin & Callahan, 1994)., higher education, and school

administration regarding professional development. It appears that a renewed interest in meeting the needs of gifted students exists in rural and urban areas, but the approach to accomplish such goal remains varied.

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